

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
Use of Spectrum Bands Above 24 GHz For	)	GN Docket No.14-177
Mobile Radio Services	)	
	)	
Establishing a More Flexible Framework to	)	IB Docket No. 15-256
Facilitate Satellite Operations in the 27.5-28.35	)	
GHz and 37.5-40 GHz Bands	)	
	)	
Petition for Rulemaking of the Fixed Wireless	)	RM-11664
Communications Coalition to Create Service	)	
Rules for the 42-43.5 GHz Band	)	
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95,	)	WT Docket No. 10-112
and 101 To Establish Uniform License Renewal,	)	
Discontinuance of Operation, and Geographic	)	
Partitioning and Spectrum Disaggregation Rules	)	
and Policies for Certain Wireless Radio Services	)	
	)	
Allocation and Designation of Spectrum for	)	IB Docket No. 97-95
Fixed-Satellite Services in the 37.5-38.5 GHz,	)	
40.5-41.5 GHz and 48.2-50.2 GHz Frequency	)	
Bands; Allocation of Spectrum to Upgrade Fixed	)	
and Mobile Allocations in the 40.5-42.5 GHz	)	
Frequency Band; Allocation of Spectrum in the	)	
46.9-47.0 GHz Frequency Band for Wireless	)	
Services; and Allocation of Spectrum in the 37.0-	)	
38.0 GHz and 40.0-40.5 GHz for Government	)	
Operations	)	

**COMMENTS OF MOBILE FUTURE**

Mobile Future submits these comments in response to the Federal Communications Commission’s Further Notice of Proposed Rulemaking (“FNPRM”) promoting uses of spectrum above 24 GHz for commercial purposes.<sup>1</sup> Mobile Future urges the Commission to continue to

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<sup>1</sup> *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 (2016) (“Report and Order” or “FNPRM”).

move quickly in this proceeding, both to finalize rules applicable to the bands identified in the Report and Order<sup>2</sup> and to make additional spectrum bands available for flexible use.

**I. THE COMMISSION SHOULD CONTINUE TO MOVE QUICKLY TO MAKE HIGH-BAND SPECTRUM AVAILABLE FOR FLEXIBLE USE**

Continued swift action in this proceeding to make high-band spectrum available for flexible use is essential to ensuring that the United States maintains its wireless leadership position as the industry moves full steam ahead toward fifth generation (“5G”) networks.<sup>3</sup> With 99.7 percent of the United States population now covered by 4G LTE service, 98.8 percent covered by two or more providers, and 95.9 percent covered by three or more providers,<sup>4</sup> mobile broadband providers are looking to the next generation of wireless while continuing to enhance 4G LTE coverage and service. Mobile operators and vendors have recently announced tremendous progress in the development of 5G technology, even since just mid-2016. For example, Verizon recently completed its 5G radio specification in collaboration with its 5G Technology Forum, which will allow industry partners such as chipset vendors, network vendors, and mobile operators to develop interoperable solutions and contribute to pre-standard testing and fabrication.<sup>5</sup> AT&T announced it has seen speeds of up to 14 Gbps on 5G

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<sup>2</sup> *Report and Order*, 31 FCC Rcd at 8023 ¶ 18.

<sup>3</sup> *See* Comments of Mobile Future, GN Docket No. 14-177 (filed Jan. 27, 2016).

<sup>4</sup> *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, WT Docket No. 16-137, Nineteenth Report, DA 16-1061, at ¶ 39 (rel. Sept. 23, 2016).

<sup>5</sup> *Verizon is First U.S. Carrier to Complete 5G Radio Specifications: Pre-Commercial Trials Continue Full Steam Ahead* (July 11, 2016), <http://www.verizon.com/about/news/verizon-first-us-carrier-complete-5g-radio-specifications-pre-commercial-trials-continue-full>.

technology in the 15 GHz band.<sup>6</sup> T-Mobile and Ericsson recently achieved data transfer speeds of 12 Gbps and ultra-low latency of less than 2 milliseconds during a 5G test.<sup>7</sup> Sprint recently tested 5G technology with Nokia and Ericsson using 73 GHz and 15 GHz spectrum during the Copa America soccer tournament in Santa Clara, and achieved download speeds up to 4 Gbps and low millisecond latency.<sup>8</sup>

The Commission must continue to press forward to finalize the service rules for the spectrum identified in the Report and Order and to make available additional spectrum identified in the FNPRM to facilitate the development and deployment of 5G services in the United States. Specifically, the Commission should:

- Make additional spectrum available for flexible use in the spectrum bands above 24 GHz;
- Use large license area sizes, to the extent the Commission adopts exclusive, flexible use geographic area licensing;
- Decline to extend the 3.5 GHz three-tiered sharing regime to the 70 GHz and 80 GHz bands;
- Decline to use the untested Spectrum Access System (“SAS”) model for frequency coordination in the 37 GHz Band;
- Decline to adopt a use-or-share regime in the Upper Microwave Flexible Use Service (“UMFUS”) bands; and

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<sup>6</sup> Mike Dano, *AT&T Seeing 14 Gbps to One User, 5 Gbps to Two Users in 5G Tests*, *FierceWireless* (Aug. 11, 2016), <http://www.fiercewireless.com/tech/at-t-seeing-14-gbps-to-one-user-5-gbps-to-two-users-5g-tests>.

<sup>7</sup> Neville Ray, *The Un-carrier Road to 5G*, T-Mobile (Sept. 20, 2016), <https://newsroom.t-mobile.com/news-and-blogs/the-un-carrier-road-ahead.htm>.

<sup>8</sup> Dan Meyer, *Verizon, AT&T, T-Mobile and Spring Deep into 5G Testing across High-Band Spectrum*, RCR Wireless News (July 14, 2016), <http://www.rcrwireless.com/20160714/carriers/verizon-att-t-mobile-sprint-deep-5g-testing-across-high-band-spectrum-tag2>.

- Decline to extend spectrum aggregation limits to any additional mmW spectrum bands.

**A. The Commission Should Make Available Spectrum Bands Identified in the FNPRM with Increased Geographic License Area Sizes**

The Commission should move forward to make additional spectrum above 24 GHz available for flexible use.<sup>9</sup> To the extent the Commission adopts geographic area licensing for the bands, it should use license sizes larger than the Partial Economic Areas (“PEA”) proposed in the FNPRM. Larger license area sizes will reduce administrative burdens for the Commission and licensees alike, and will thereby increase the potential value and usability of the spectrum. And while services using these bands may be localized, licenses need not be sized at an equally granular level. Larger license sizes will encourage investment on a broader basis and will eliminate the need for complicated coordination between licensees at license area borders. Further, PEAs have not yet had proven success, unlike Basic Trading Areas (“BTAs”) or Economic Areas (“EAs”) which have had proven, longstanding success at fostering investment in wireless networks.

**B. The Commission Should Decline to Adopt the Three-Tiered Approach as Proposed in the 70 GHz and 80 GHz Bands**

The Commission should not extend the 3.5 GHz framework to the 71-76 GHz band (“70 GHz band”) and 81-86 GHz band (“80 GHz band”). The three-tiered sharing framework has not yet been tested, and, as government officials have pointed out, extending use of a SAS to the mmW bands would be premature.<sup>10</sup> If the Commission nonetheless moves forward with its

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<sup>9</sup> *FNPRM*, 31 FCC Rcd at 8145 ¶¶ 373, 375.

<sup>10</sup> NTIA Associate Administrator – Spectrum Management Paige Atkins recently noted that while the FCC has not yet certified a SAS, “It’s really about getting to a point where we’ve established some level of confidence across the stakeholders .... We’re already talking about employing SAS ... in other bands when we haven’t even fully proven it out.” Howard Buskirk,

proposal, it should make several adjustments to what it adopted in the 3.5 GHz band. Priority Access License terms should be significantly longer than the one year terms proposed in the FNPRM and should include a renewal expectancy. A one-year, nonrenewable license term will not provide the certainty required to foster investment in these bands. Investors need more assurance that they will be able to earn a return on their investments, and potential customers need to know that their service will continue uninterrupted for more than one year at a time. A renewal expectancy, dependent on meeting appropriate performance requirements, will encourage deployment and will ensure that Priority Access Licensees continue to have access to spectrum on which they are providing service.

**C. The Commission Should Not Use a Dynamic SAS Mechanism for Frequency Coordination in the 37 GHz Band**

Nor should the Commission use a dynamic SAS for frequency coordination in the 37 GHz band. As the Commission notes, in the lower segment of the 37 GHz band, “the sharing environment is relatively straightforward – there are limited incumbent uses that need to be protected, and Federal and non-Federal fixed and mobile users will have coequal rights to the band.”<sup>11</sup> Therefore, use of a dynamic SAS is unnecessary would create unnecessary risk and uncertainty in the band.

**D. A Use-or-Share Regime Is Not Appropriate for the UMFUS Bands**

The Commission should not adopt a “use-or-share” requirement in the UMFUS bands. Licensees need certainty that they will have access to spectrum acquired in the mmW bands for a sufficient amount of time in order to conduct intensive research and achieve returns on their

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*Approach to Cybersecurity Seen As Providing Model for Interference Protection*, Communications Daily (Sept. 19, 2016).

<sup>11</sup> FNPRM, 31 FCC Rcd at 8170 ¶ 449.

investments. Adopting a use-or-share requirement would needlessly limit licensees' flexibility to examine different uses and technologies, and could imperil development of innovative 5G technologies in the bands. The Commission should instead adhere to its longstanding and proven policy of making spectrum available on a licensed, exclusive use basis, which has fostered the incredible success of 4G LTE service in the United States. Further, sufficient spectrum is already available on an unlicensed basis in the mmW bands, and there is no evidence that granting access to additional bands on a shared basis will outweigh the proven benefits of exclusively licensing spectrum.

**E. The Commission Should Not Extend Spectrum Aggregation Limits to Any Additional mmW Spectrum Bands**

Spectrum aggregation limits are not appropriate for the additional bands the Commission proposes to make available in the FNPRM. As with the spectrum bands identified in the Report and Order, many mmW spectrum use cases are not yet defined and it is premature to apply spectrum aggregation caps, which may hinder innovation and development of the spectrum. However, aggregation limits are particularly unwarranted for the bands proposed in the FNPRM, as these bands have “challenges that must be overcome ... including existing allocations and/or operations.”<sup>12</sup> Further, to the extent the Commission adopts its proposals for shared use in many of the additional bands, application of any spectrum aggregation limits would be particularly inappropriate. Applying the Commission's standard secondary market rules will provide ample opportunities for a range of parties to obtain the spectrum either at auction or on the secondary market, and will ensure the spectrum is put to its highest and best use.

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<sup>12</sup> *Id.* at 8145 ¶ 374.

## II. CONCLUSION

Mobile Future urges the Commission to move quickly to make both the mmW spectrum identified in the Report and Order and additional mmW spectrum available for flexible use. The Commission should utilize proven regulatory tools to provide the certainty necessary to facilitate the investment necessary to develop and deploy 5G technologies.

Respectfully submitted,

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